PATENT
Attorney Docket No. 0050-0159

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of	)	
	)	
Yoshinori Takasaki	)	Group Art Unit: 2616
	)	
Application No.: 09/931,922	)	Examiner: C. Grey
	)	
Filed: August 20, 2001	)	
	)	
For: ROUTE CONTOL SYSTEM AND ROUTE CONTROL METHOD IN A SWITCHING APPARATUS	)	

APPEAL BRIEF

U.S. Patent and Trademark Office
Customer Window, Mail Stop Appeal Brief – Patents
Randolph Building
401 Dulany Street
Alexandria, Virginia 22314

Sir:

This Appeal Brief is submitted in response to the Final rejection mailed September 24, 2007 and in support of the Notice of Appeal filed December 26, 2007.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Juniper Networks, Inc.

II. RELATED APPEALS AND INTERFERENCES

The Appellant is unaware of any related appeals, interferences or judicial proceedings.

III. STATUS OF CLAIMS

Claims 1-20 are pending in this application and stand rejected. Claims 1-20 are the subject of the present appeal.

IV. STATUS OF AMENDMENTS

No Amendment has been filed subsequent to the Final Office Action mailed September 24, 2007.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Each of the independent claims involved in this appeal is recited below, followed in parenthesis by examples of where support can be found in the specification and figure 1 for the claimed subject matter. In addition, each dependent claim argued separately below is also summarized in a similar manner.

Claim 1 recites: A route monitor control system comprising: a plurality of OAM cell handlers (OCHs) (e.g., Fig. 1, 4); a plurality of virtual path handlers (VPHs) (e.g., Fig. 1, 1; page 6, lines 9-11); a plurality of virtual channel handlers (VCHs) (e.g., Fig. 1, 2); a plurality of trunks (e.g., Fig. 1, 3); and a control unit (e.g., Fig. 1, 5) configured to: issue an OAM (operation and maintenance) cell send instruction to a first one of said plurality of OAM cell handlers (e.g., page 7, lines 22-25), control said first OAM cell handler to carry out a loop back control test to at least one of said virtual path handlers, at least one of said virtual channel handlers, and at least one of said trunks, which are associated with said first OAM cell handler in response to said OAM cell

send instruction (e.g., page 7, line 25 to page 8, line 3), and when said first OAM cell handler sends out an OAM cell in response to said OAM cell send instruction, determine a fault position based on returning or non-returning of the OAM cell to said first OAM cell handler (e.g., page 7, lines 7-18 and page 8, lines 4-17).

Claim 2 recites: The route monitor control system according to claim 1, wherein said control unit is further configured to: carry out a switching operation of a route from at least one of said virtual path handlers to at least one of said trunks for fault avoidance based on the determined fault position (e.g., page 7, lines 11-15).

Claim 3 recites: The route monitor control system according to claim 1, wherein said plurality of OAM cell handlers, said plurality of virtual path handlers, said plurality of virtual channel handlers, said plurality of trunks, and said control unit are contained in an ATM (asynchronous transfer mode) switching apparatus (e.g., page 3, lines 18-22).

Claim 7 recites: A route monitor control method comprising: issuing an OAM (operation and maintenance) cell send instruction to a specific one of a plurality of OAM cell handlers (e.g., page 7, lines 22-24); carrying out a loop back control test to at least one of a plurality of path handlers, at least one of a plurality of channel handlers, and a trunk, which are associated with said specific OAM cell handler, in response to said OAM cell send instruction (e.g., page 7, line 25 to page 8, line 3); sending out an OAM cell from said specific OAM cell handler in response to said OAM cell send instruction (e.g., page 8, lines 4-11); and determining a fault position

based on returning or non-returning of the OAM cell to said specific OAM cell handler (e.g., page 7, lines 7-18 and page 8, lines 12-17).

Claim 8 recites: The route monitor control method according to claim 7, further comprising: carrying out a route switching operation for fault avoidance based on the determined fault position (e.g., page 7, lines 11-15).

Claim 10 recites: The route monitor control method according to claim 7, wherein said path handlers, said channel handlers, said trunk, and said specific OAM cell handler are contained in an ATM (asynchronous transfer mode) switching apparatus (e.g., page 3, lines 18-22).

Claim 13 recites: A system, comprising: a plurality of testing devices (e.g., Fig. 1, 4); a plurality of path handlers (e.g., Fig. 1, 1); a plurality of channel handlers (e.g., Fig. 1, 2); a plurality of trunks (e.g., Fig. 1, 3); and a control unit (e.g., Fig. 1, 5) configured to: issue an instruction to a first one of the plurality of testing devices, the instruction indicating that the first testing device is to perform a loopback control test (e.g., page 7, line 22 to page 8, line 3), wherein the first testing device is configured to: receive the instruction (e.g., page 7, lines 22-23), send test data to at least one of the path handlers, channel handlers or trunks in response to the instruction (e.g., page 7, lines 7-9 and page 8, lines 4-11), receive back at least some of the test data (e.g., page 7, lines 9-18 and page 8, lines 4-9), and forward results of the loopback control test to the control unit (e.g., page 8, lines 9-11), wherein the control unit is further configured to:

identify a fault based on the forwarded results (e.g., page 8, lines 12-17).

Claim 18 recites: The route monitor control system of claim 13, wherein the control unit is configured to forward loopback control test initiation instructions to the plurality of the testing devices (e.g., page 8, lines 21-27).

Claim 20 recites: The system of claim 13, wherein the plurality of path handlers, the plurality of channel handlers and the plurality of trunks are contained in a single switching apparatus (e.g., page 3, lines 18-22).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 1, 3-7 and 9-20 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Nagata et al. (U.S. Patent No. 6,269,083; hereinafter Nagata).

B. Claims 2 and 8 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagata.

VII. ARGUMENT

A. Rejection under 35 U.S.C. § 102 based on Nagata

The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention always rests upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). A proper rejection under 35 U.S.C. § 102 requires that a single reference teaches every element set forth in the claim, either expressly or inherently. See M.P.E.P. § 2131.

1. Claims 1, 4-7, 9, 11, 12

With these principles in mind, claim 1 recites a route monitor control system comprising a plurality of OAM cell handlers (OCHs), a plurality of virtual path handlers (VPHs), a plurality of virtual channel handlers (VCHs) and a plurality of trunks. The Final Office Action states that OAM cell controller 37 in Fig. 5 of Nagata is equivalent to the claimed plurality of OCHs, exchange B (element 12) in Fig. 2 of Nagata is equivalent to the claimed plurality of VPHs, exchange C (element 13) in Fig. 2 of Nagata is equivalent to the claimed plurality of VCHs and points to col. 6, lines 36-46 as disclosing trunks (Final Office Action – page 2). The Appellant respectfully disagrees with the analysis of Nagata with respect to the claimed elements.

OAM cell controller 37 in Fig. 5 of Nagata is contained in ATM exchange function block 31 and operates to transmit an OAM loopback cell to the designated communication path (Nagata – col. 9, lines 35-45). Nagata does not disclose or suggest that this single cell controller of Nagata is equivalent to a plurality of OAM cell handlers, as recited in claim 1. Nagata also discloses that elements 12 and 13 correspond to exchanges or network elements in an ATM network (Nagata – col. 6, lines 22-38). Nagata does not disclose or suggest that exchange 12 is equivalent to a plurality of virtual path handlers or that exchange 13 is equivalent to a plurality of virtual channel handlers, as alleged in the Final Office Action. In contrast, Nagata merely discloses that exchanges 12 and 13 are network elements contained in an ATM network that are located between exchange 11 and subscriber terminal 16.

Claim 1 also recites a control unit configured to issue an OAM (operation and maintenance) cell send instruction to a first one of said plurality of OAM cell handlers, control said first OAM cell handler to carry out a loop back control test to at least one of said virtual path

handlers, at least one of said virtual channel handlers, and at least one of said trunks, which are associated with said first OAM cell handler in response to said OAM cell send instruction, and when said first OAM cell handler sends out an OAM cell in response to said OAM cell send instruction, determine a fault position based on returning or non-returning of the OAM cell to said first OAM cell handler. Initially, the Appellant notes that since Nagata does not disclose the claimed plurality of OAM cell handlers, plurality of VPHs and plurality of VCHs, Nagata cannot further disclose a control unit configured to issue an OAM cell send instruction and control a first OAM cell handler to carry out a loopback test to at least one of the VPHs, at least one of said VCHs and at least one of said trunks, which are associated with the first OAM cell handler, as required by claim 1.

The Final Office Action states that maintenance interface controller 36 of Nagata is equivalent to the claimed control unit (Final Office Action – page 2). Appellant respectfully disagrees.

Nagata discloses that maintenance console 35 sends maintenance interface information to maintenance interface controller 36, which then sends an OAM cell transmission request to OAM cell transmission control unit 37a. The OAM cell transmission control unit 37a then sends an OAM cell transmission request to OAM cell transmitter 33a, which transmits the OAM loopback cell to the path route (Nagata – col. 12, lines 35-52). Nagata does not disclose or suggest that maintenance interface controller 36 issues an OAM cell send instruction to a first OAM cell handler and controls said first OAM cell handler to carry out a loopback control test to at least one virtual path handler, at leas one virtual path handler and at least one trunk associated with the first OAM cell handler, as recited in claim 1. In contrast, maintenance interface

controller 36 merely forwards information associated with transmitting a general OAM loopback cell on a path route.

In other words, the testing performed by Nagata is directed to testing a path/route in an ATM network to an ATM endpoint that interfaces with a subscriber terminal. Claim 1, in contrast, recites that the control unit is configured to control a first OAM cell handler to carry out a loop back control test to at least one of the VPHs, at least one of the VCHs and at least one of the trunks. That is, the testing performed in claim 1 is directed to testing VPHs, VCHs and trunks of an ATM switching system. Nagata, as discussed above and in contrast to claim 1, merely discloses testing a path from exchange A (element 11 in Fig. 2) to exchange D (element 14 in Fig. 4). This general path testing performed in Nagata cannot be fairly construed to disclose or suggest the specifically recited loop back control test to at least one virtual path handler, at least one virtual channel handler and at least one trunk performed by the OAM cell handler under the control of the control unit, as recited in claim 1.

In response to similar arguments made in the previous response, the Final Office Action states that Nagata exchange 12 of Nagata is equivalent to a virtual path handler and points to col. 8, lines 9-13 of Nagata for support (Final Office Action – page 6). The Final Office Action also states that Nagata discloses that the exchanges deal with information involving virtual paths and virtual channels and points to col. 2, lines 60-63 for support (Final Office Action – page 6). The Final Office Action further adds that the terms virtual channel handlers and virtual path handlers are interpreted broadly as devices handling virtual path information and/or virtual channel information and points to col. 14, lines 16-24 for support (Final Office Action – page 6). The Appellant respectfully disagrees.

Nagata at col. 8, lines 9-13 discloses that if there are a plurality of paths to be inspected for a route, then the total sequence number (SN) column 25a and the area address column 25b illustrated in Fig. 4 are provided for each of the paths to store data of the respective paths. This portion of Nagata merely discloses that multiple paths may be inspected for a particular route. This portion of Nagata does not disclose or suggest that exchange 12 is a virtual path handler.

Nagata at col. 2, lines 60-63 discloses that a communication route in an ATM network includes virtual paths or virtual channels and a plurality of communication devices for terminating or relaying the virtual paths or virtual channels. Therefore, this portion of Nagata provides no support for the allegation that the testing performed by Nagata tests at least one virtual path handler, at least one virtual channel handler and at least one trunk, as required by claim 1. In contrast, this portion of Nagata actually teaches away from the features of claim 1. That is, Nagata discloses that the ATM network of Nagata includes virtual paths **or** virtual channels. Therefore, the loop back testing in Nagata could not include carrying out a loop back control test to at least one virtual path handler **and** at least one virtual channel handler, as required by claim 1.

Nagata at col. 14, lines 16-24 discloses that each of the exchanges periodically collects traffic information with the ATM circuit control device 33, where the traffic information corresponds to information about the number of user cells passed on a communication path of a permanent virtual connection (PVC) or a switched virtual connection (SVC). This portion of Nagata also does not disclose or suggest a control unit configured to control a first OAM cell handler to carry out a loop back control test to at least one virtual path handler, at least one virtual channel hander and at least one trunk. In contrast, this portion of Nagata merely discloses

that the exchanges A-D collect traffic information associated with a PVC or SVC.

Therefore, none of the portions of Nagata referenced in the Final Office Action, or any other portions, discloses or suggests that maintenance interface controller 36 of Nagata controls a first OAM cell handler to carry out a loop back control test to at least one virtual path handler, at least one virtual channel handler and at least one trunk, as required by claim 1.

Further, the Appellant asserts that modifying Nagata to perform such testing would not have been obvious based on the disclosure of Nagata due to the significantly different testing performed by Nagata. For example, Nagata, as discussed above, merely discloses that exchange A (element 11 in Fig. 2) carries out a loop back test for a path from exchange A (element 11 in Fig. 2) to exchange D (element 14) via intermediate exchanges B and C (elements 12 and 13). Such path/route testing is not equivalent to and does not suggest the particularly recited testing of claim 1.

For at least these reasons, Nagata does not disclose or suggest each of the features of claim 1. Accordingly, the Appellant respectfully submits that the imposed rejection of claim 1 under 35 U.S.C. § 102 based on Nagata is improper. Therefore, reversal of the rejection of claims 1, 4-7, 9, 11, 12 is respectfully requested.

2. Claims 3 and 10

Claim 3 is dependent on claim 1 and recites that the plurality of OAM cell handlers, the plurality of virtual path handlers, the plurality of virtual channel handlers, the plurality of trunks and the control unit are contained in an ATM switching apparatus. The Final Office Action

states that Nagata discloses this feature and points to Fig. 5, items 31 and 34 for support (Final Office Action – page 3). The Appellant respectfully disagrees.

Fig. 5 of Nagata illustrates the structure of each of exchanges 11-14 (Nagata – col. 9, lines 4-5). In Fig. 5, element 31 is an ATM exchange function block and element 34 is an ATM switch unit. The elements alleged to be equivalent to the claimed VPHs, VCHs and trunks are exchanges 12, 13 and the links interconnecting the exchanges in Fig. 2 (Final Office Action – page 2). Exchanges 12 and 13 and the links interconnecting these exchanges are not included in the same ATM switching apparatus, as required by claim 3. In contrast, exchanges 12 and 13 and the interconnecting links are separate network elements used to route data in an ATM network.

In response to similar arguments made in the previous response, the Final Office Action states that since the units are directly connected to a switching unit where the switch is dedicated for routing based on routing information, and routing information comes from ATM exchange blocks, the exchange block would be considered a form of switching apparatus (Final Office Action – page 7). The Appellant respectfully disagrees.

As discussed above, the exchange blocks 11-14 in Nagata are clearly separate network elements that may be connected via links. These exchanges, however, are clearly not contained in an ATM switching apparatus, as recited in claim 3.

For at least these reasons, the Appellant respectfully submits that the imposed rejection of claim 3 under 35 U.S.C. § 102 based on Nagata is improper. Accordingly, reversal of the rejection of claims 3 and 10 is respectfully requested.

3. Claims 13-17 and 19

Claim 13 recites a system comprising a plurality of testing devices, a plurality of path handlers, a plurality of channel handlers and a plurality of trunks. Similar to the discussion above with respect to claim 1, Nagata does not disclose or suggest these elements. For example, OAM cell controller 37 in Fig. 5 of Nagata is contained in ATM exchange function block 31 and operates to transmit an OAM loopback cell to the designated communication path (Nagata – col. 9, lines 35-45). Nagata does not disclose or suggest that this single OAM cell controller 37 (or the single maintenance interface controller 36) of Nagata is equivalent to a plurality of testing devices, as recited in claim 13. Nagata also discloses that elements 12, 13 and 14 correspond to exchanges or network elements in an ATM network (Nagata – col. 6, lines 22-38). Nagata does not disclose or suggest that exchange 12 is equivalent to a plurality of path handlers or that exchange 13 is equivalent to a plurality of channel handlers, as alleged in the Final Office Action. In contrast, Nagata merely discloses that exchanges 12 and 13 are network elements contained in an ATM network that are located between exchange 11 and subscriber terminal 16.

Claim 13 also recites that the system includes a control unit configured to issue an instruction to a first one of the plurality of testing devices, the instruction indicating that the first testing device is to perform a loopback control test. Claim 13 further recites that the first testing device is configured to receive the instruction and send test data to at least one of the path handlers, channel handlers or trunks in response to the instruction. Since Nagata does not disclose or suggest the claimed plurality of testing devices, Nagata cannot further disclose or suggest a control unit to issue an instruction to a first one of the plurality of testing devices, the instruction indicating that the first testing device is to perform a loopback control test, much less

that the first testing device is configured to send test data to at least one of the path handlers, channel handlers or trunks in response to the instruction, as required by claim 13.

For at least these reasons, the Appellant respectfully submits that the imposed rejection of claim 13 under 35 U.S.C. § 102 based on Nagata is improper. Accordingly, reversal of the rejection of claims 13-17 and 19 is respectfully requested.

4. Claim 18

Claim 18 is dependent on claim 13 and recites that the control unit is configured to forward loopback control test initiation instructions to the plurality of the testing devices. The Final Office Action states that Nagata discloses this feature and points to col. 12, lines 35-52 for support (Final Office Action – page 4). The Appellant respectfully disagrees.

Nagata at col. 12, lines 35-52 discloses that maintenance console 35 sends maintenance interface information to maintenance interface controller 36. This portion of Nagata also discloses that maintenance interface controller 36 sends an OAM cell transmission request to the OAM cell transmission control unit 37a, which then transmits an OAM cell transmission request to OAM cell information setting unit 33c. This portion of Nagata further discloses that OAM cell information setting unit 33c sets end to end cell in the ATM cell common section column 21 of an OAM loopback cell and sends an OAM cell transmission request to OAM cell transmitter 33a, which then transmits the OAM loopback cell to the path route. This portion of Nagata, however, does not disclose or suggest a control unit that is configured to forward loopback control test initiation instructions to a plurality of testing devices, as required by claim 18. In contrast, this portion of Nagata merely discloses sending a single OAM cell transmission request

from maintenance interface controller 36 to ATM cell transmitter 33 via a number of intermediate devices. These intermediate devices, however, are not equivalent to a plurality of testing devices. Therefore, Nagata cannot be fairly construed to disclose or suggest a control unit configured to forward loopback control test initiation instructions to a plurality of testing devices.

For at least these reasons, the Appellant respectfully submits that the imposed rejection of claim 18 under 35 U.S.C. § 102 based on Nagata is improper. Accordingly, reversal of the rejection of claim 18 is respectfully requested.

5. Claim 20

Claim 20 is dependent on claim 13 and recites that the plurality of path handlers, the plurality of channel handlers and the plurality of trunks are contained in a single switching apparatus. Similar to the discussion above with respect to claim 3, exchanges 12, 13 and the links interconnecting the exchanges in Fig. 2, which were alleged to be equivalent to the plurality of path handlers, channel handlers and trunks are separate network elements used to route data in an ATM network. These elements of Nagata are clearly not contained in a single switching apparatus, as recited in claim 20.

For at least these reasons, the Appellant respectfully submits that the imposed rejection of claim 20 under 35 U.S.C. § 102 based on Nagata is improper. Accordingly, reversal of the rejection of claim 20 is respectfully requested.

B. Rejection of claims 2 and 8 under 35 U.S.C. § 103(a) based on Nagata

As described above, the initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention always rests upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In rejecting a claim under 35 U.S.C. § 103, the Examiner must provide a factual basis to support the conclusion of obviousness. In re Warner, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967). Based upon the objective evidence of record, the Examiner is required to make the factual inquiries mandated by Graham v. John Deere Co., 86 S.Ct. 684, 383 U.S. 1, 148 USPQ 459 (1966). The Examiner is also required to explain how and why one having ordinary skill in the art would have been realistically motivated to modify an applied reference and/or combine applied references to arrive at the claimed invention. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

1. Claim 2

With the above principles in mind, claim 2 recites that the control unit of claim 1 is further configured to carry out a switching operation of a route from at least one of said virtual path handlers to at least one of said trunks for fault avoidance based on the determined fault position.

The Final Office Action admits that Nagata does not disclose this feature, but states that it would have been obvious that a switching operation take place in order to switch from the determined fault position (Final Office Action – pages 5-6). The Appellant respectfully disagrees.

Nagata discloses that alarm analyzer 38d reads collected information and determines whether a fault occurred (Nagata – col. 17, lines 5-14). Nagata further discloses that message

editing unit 39 sends a message output request to maintenance interface controller 36, which sends a message to the service personnel with the location and cause of the fault (Nagata – col. 17, lines 15-25). Nagata clearly does not disclose or suggest that maintenance interface controller 36 (alleged to be equivalent to the claimed control unit) carries out a switching operation of a route from at least one of said virtual path handlers to at least one of said trunks for fault avoidance based on the determined fault position. In contrast, Nagata merely discloses that maintenance interface controller 36 notifies service personnel of the location and cause of the fault. Presumably, service personnel would then investigate the fault. Nagata, however, does not disclose or suggest that maintenance interface controller 36 (or any other device) carries out a switching operation of a route from at least one of said virtual path handlers to at least one of said trunks for fault avoidance based on the determined fault position, as required by claim 2.

For at least these reasons, the Appellant respectfully submits that the imposed rejection of claim 2 under 35 U.S.C. § 103 based on Nagata is improper. Accordingly, reversal of the rejection of claim 2 is respectfully requested.

2. Claim 8

Claim 8 recites that the method of claim 7 further comprises carrying out a route switching operation for fault avoidance based on the determined fault position. Similar to the discussion above with respect to claim 2, the Final Office Action admits that Nagata does not disclose this feature, but states that it would have been obvious that a switching operation take place in order to switch from the determined fault position (Final Office Action – pages 5-6). The Appellant respectfully disagrees.

As discussed above with respect to claim 2, Nagata discloses that alarm analyzer 38d reads collected information and determines whether a fault occurred (Nagata – col. 17, lines 5-14). Nagata further discloses that message editing unit 39 sends a message output request to maintenance interface controller 36, which sends a message to the service personnel with the location and cause of the fault (Nagata – col. 17, lines 15-25). Nagata clearly does not disclose or suggest carrying out a route switching operation for fault avoidance based on the determined fault position. In contrast, Nagata merely discloses notifying service personnel of the location and cause of the fault.

For at least these reasons, the Appellant respectfully submits that the imposed rejection of claim 8 under 35 U.S.C. § 103 based on Nagata is improper. Accordingly, reversal of the rejection of claim 8 is respectfully requested.

VIII. CONCLUSION

In view of the foregoing arguments, the Appellant respectfully solicits the Honorable Board to reverse the Examiner's rejections of claims 1-20. In addition, as the Appellant's remarks with respect to the Examiner's rejections are sufficient to overcome the rejections, the Appellant's silence as to assertions by the Examiner in the Final Office or certain requirements that may be applicable to such rejections (e.g., whether a reference constitutes prior art) is not a concession by the Appellant that such assertions are accurate or such requirements have been met, and the Appellant reserves the right to analyze and dispute such in the future.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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IX. APPENDIX

1. A route monitor control system comprising:

a plurality of OAM cell handlers (OCHs);

a plurality of virtual path handlers (VPHs);

a plurality of virtual channel handlers (VCHs);

a plurality of trunks; and

a control unit configured to:

issue an OAM (operation and maintenance) cell send instruction to a first one of said plurality of OAM cell handlers,

control said first OAM cell handler to carry out a loop back control test to at least one of said virtual path handlers, at least one of said virtual channel handlers, and at least one of said trunks, which are associated with said first OAM cell handler in response to said OAM cell send instruction, and

when said first OAM cell handler sends out an OAM cell in response to said OAM cell send instruction, determine a fault position based on returning or non-returning of the OAM cell to said first OAM cell handler.

2. The route monitor control system according to claim 1, wherein said control unit is further configured to:

carry out a switching operation of a route from at least one of said virtual path handlers to at least one of said trunks for fault avoidance based on the determined fault position.

3. The route monitor control system according to claim 1, wherein said plurality of OAM cell handlers, said plurality of virtual path handlers, said plurality of virtual channel handlers, said plurality of trunks, and said control unit are contained in an ATM (asynchronous transfer mode) switching apparatus.

4. The route monitor control system according to claim 1, wherein said control unit is further configured to:

periodically issue said OAM cell send instruction to said first OAM cell handler.

5. The route monitor control system according to claim 1, wherein said control unit is configured to:

determine the fault position based on returning or non-returning of each of the OAM cells to said first OAM cell handler.

6. The route monitor control system according to claim 1, wherein said control unit is configured to:

carry out the issuing operation, the loop back control test and the determining operation while changing said first OAM cell handler among said plurality of OAM cell handlers.

7. A route monitor control method comprising:

issuing an OAM (operation and maintenance) cell send instruction to a specific one of a plurality of OAM cell handlers;

carrying out a loop back control test to at least one of a plurality of path handlers, at least one of a plurality of channel handlers, and a trunk, which are associated with said specific OAM cell handler, in response to said OAM cell send instruction;

sending out an OAM cell from said specific OAM cell handler in response to said OAM cell send instruction; and

determining a fault position based on returning or non-returning of the OAM cell to said specific OAM cell handler.

8. The route monitor control method according to claim 7, further comprising:

carrying out a route switching operation for fault avoidance based on the determined fault position.

9. The route monitor control method according to claim 7, wherein said carrying out a loop back control test is performed in an ATM (asynchronous transfer mode) switching apparatus.

10. The route monitor control method according to claim 7, wherein said path handlers, said channel handlers, said trunk, and said specific OAM cell handler are contained in an ATM (asynchronous transfer mode) switching apparatus.

11. The route monitor control method according to claim 7, wherein said issuing comprises:

periodically issuing said OAM cell send instruction to said specific OAM cell handler.

12. The route monitor control method according to claim 7, wherein said carrying out comprises:

carrying out said loop back control test to all of said path handlers, said channel handlers, and said trunk in response to said OAM cell send instruction, and

said sending out comprises:

sending out OAM cells from said specific OAM cell handler in response to said OAM cell send instruction.

13. A system, comprising:

a plurality of testing devices;

a plurality of path handlers;

a plurality of channel handlers;

a plurality of trunks; and

a control unit configured to:

issue an instruction to a first one of the plurality of testing devices, the instruction indicating that the first testing device is to perform a loopback control test,

wherein the first testing device is configured to:

receive the instruction,

send test data to at least one of the path handlers, channel handlers or trunks in response to the instruction,

receive back at least some of the test data, and

forward results of the loopback control test to the control unit,

wherein the control unit is further configured to:

identify a fault based on the forwarded results.

14. The system of claim 13, wherein the control unit is configured to periodically issue the instruction to the first testing device.

15. The system of claim 13, wherein when forwarding results, the first testing device is configured to:

forward information to the control unit based on return of the test data to the first testing device.

16. The system of claim 15, wherein when identifying a fault, the control unit is configured to identify the fault based on the forwarded information.

17. The system of claim 13, wherein the control unit is further configured to:

perform a fault avoidance operation based on the identified fault.

18. The route monitor control system of claim 13, wherein the control unit is configured to forward loopback control test initiation instructions to the plurality of the testing devices.

19. The system of claim 13, wherein the plurality of testing devices may be included in the plurality of path handlers, the plurality of channel handlers or the plurality of trunks.

20. The system of claim 13, wherein the plurality of path handlers, the plurality of channel handlers and the plurality of trunks are contained in a single switching apparatus.

X. EVIDENCE APPENDIX

None

XI. RELATED PROCEEDINGS APPENDIX

None